

PROJECT PLAN FOR RADIO SET RS-8 - *Project No. 2054.*

## 1. General Aim

## A. The development of equipment as follows:

I The development of a miniature beacon radio transmitter to aid in the location of cargo dropped to the ground by parachute.

II. The development of a portable radio DF receiver to be carried by the operator, which will home on a characteristic signal radiated by the transmitter, enabling the rapid location of the cargo on the ground. (An ~~initial~~ investigation will be made to determine first, if a satisfactory receiver already exists.)

III. The incorporation of additional features into the equipment above to accomplish the secondary function of aiding in the establishment of ship-to-shore rendezvous. For this communication function the transmitter will be provided with a key for C. W. transmission only.

## 2. Specific Aim

## A. The development of a radio transmitter with the following characteristics:

I. Power Source -- Dry batteries.

II. Unitization -- A single case containing the transmitter and batteries.

III. Physical Size -- Not to exceed 14" long, by 8" wide, by 6" deep.

IV. Weight -- Not to exceed 20 lbs.

V. 'Extremely Rugged.

VI. Excellent Reliability

VII. Minimum Range -- for beacon use -- 1 mile  
-- For commo use -- 10 miles.

VIII. Minimum Life -- One hour. (*continuous operation*)

IX. Power Output -- 12 Watts minimum.

X. Frequency range -- 2.5 to 4.5 mcs.

XI. Circuitry--Single tube crystal controlled oscillator  
Modulated by characteristic tone for beacon use and equipped with a key for communication use.

DOCUMENT NO. 20  
NO CHANGE IN CLASS. ☒  
☐ DECLASSIFIED  
CLASS. CHANGED TO: TS S C  
NEXT REVIEW DATE: -  
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- XII. Antenna -- For cargo chute locator an omnidirectional loop antenna  
 -- For communications use a single wire of variable length.

B. The development of a radio receiver with the following characteristics:

I. Power Source -- Batteries

II. Unitization -- Single unit ~~with separate~~ containing batteries, receiver, ~~and~~ loop, and ~~sense antenna if necessary~~ *loop*

III. Physical Size -- *(including antenna and batteries)*  
~~6" X 18" X 2"~~

IV. Weight -- not to exceed ~~5~~ lbs. *including batteries ready for 20 hr operation*

V. Ruggedness -- Moderately rugged.

VI. Reliability -- ~~Good~~ *excellent (most important)*  
~~20 hr - 4# or 100 hrs @ 10#~~ *considerations*

VII. Minimum Life -- ~~100 hours~~

VIII. Range -- I mile minimum *from beacon transmitter*  
~~10 miles on c/w communication.~~

IX. Frequency range -- 2.5 to 4.5 mcs.

X. Circuitry -- Superheterodyne

XI. Antenna -- ~~Loop~~ *(sense antenna if necessary)*  
~~(Zero-peak Antennas to be investigated)~~

XII. D-F Characteristics -- Sensing & Direction.

*Sensitivity (200  $\mu$ V/mile) audio power output - selectivity*

3. Proposed methods and time for transmitter program

A. Research	est. time	# personnel	type pers	man hours
Study of similar existing equipment	3 wks	1	proj. eng	120
Study of the system	2 wks.	1	do	80
Formulation of basic circuit	1 wk.	1	do	40
B. Development				
Construction and tests of breadboard models	4 wks	1	proj eng.	320
		1	technician	
Mechanical design preliminary drawings	1½ wks	1	draftsman	128
		1	mech. eng.	

construction of first complete model	4 wks	1	proj eng.	640
		1	technician	
		2	<i>Model Shop</i>	
tests and changes on first model	2 wks	1	proj. eng.	160
Submission of first model to test section	1 wk.			
Resulting changes and tests	2 wks.	1	proj eng	160
		1	technician	
Construction of final eng models	4 wks.	1	proj. eng.	800
		1	technician	
		2	<i>Model Shop</i>	
tests on final models	1 wk.	1	technician	80
		1	proj. eng.	
Formulation of complete manufacturing specs. and drawings	4 wks.	1	Proj. Eng.	
		1	Draftsman	
		1	Mech. Eng	
				480
Total	29½ wks	5		3008

## 4. Proposed methods and time for Receiver program

## A. Research

Study of similar existing equipment	3 wks.	1	Proj. Eng.	120
Study of the system	2 wks.	1	Proj. Eng.	80
Formulation of Basic circuits	1 wk.	1	Proj. Eng.	40

## B. Development

Construction and tests of breadboard model	5 wks.	1	Proj Eng	
		1	Technician	
				400
Mechanical Design--Preliminary drawings	2 wks.	1	Mech. Eng.	
		1	Draftsman	
				160

~~Construction of first complete model~~      ~~4 wks.~~      ~~1~~      ~~Proj. Eng.~~

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(c) Construction of first complete model	4 wks	1 Proj Eng 1 Technician 2 Model Shop	160	
Tests and Changes on above. (c)	3 wks	1 Proj Eng 1 Technician	240	
Submission of (c) to Com OPS and Chief, Eng., for criticism and comments	1 wk			
Resulting Changes and tests	2 wks	1 Proj Eng <b>7</b> 1 Technician	160	<del>160</del>
(g) Construction - final Eng models	5 wks	1 Proj Eng 1 Technician 2 Mod Shop 1 Mech Eng	1000	
Tests on above (g)	2 wks	1 Technician 1 Proj Eng	160	
Formulation of complete manufacturing specifications and drawings	5 wks	1 Proj Eng 1 Draftsman 1 Mech Eng	600	
Totals	35 wks	5 ---	<b>7</b> 3600	